and distribution are added. These, in conjunction with a glossary of terms, render the book available to everyone possessed of an elementary knowledge of botany. In addition to the descriptive text, Mr. Duthie has collected into the notes appended to the species a vast amount of information dealing with the identification and economic uses of the plants, both indigenous and cultivated. A perusal of the book not only serves to indicate how large a proportion of the Indian plants possess valuable properties, but also cannot fail to impress one with the comprehensive knowledge which has been acquired by the assiduous work of the author and other botanists in India who have occupied similar responsible positions. This part includes the orders Ranunculaceæ to Cornaceæ; the first volume will extend to the Campanulaceæ, and two volumes will complete the work.

A Laboratory Guide to Qualitative Analysis with the Blowpipe. By F. W. Martin, Ph.D. Pp. iv+47. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1903.) Price 2*s.* 10*d.*

THE author regards the restricted employment of the blowpipe in analysis as due to the lack of a convenient manual or work of reference, which this modest little volume of fifty pages is now intended to supply.

It may be questioned whether, in a well-equipped laboratory, the use of the blowpipe as a delicate instrument for qualitative analysis will supersede other methods. For the mineralogist, and especially for the mining prospector, the classic of Plattner-Richter, which has been translated into English by Cornwall, will always hold its place.

There is nothing in the present volume to call for special notice. The matter is very condensed, occasionally at the risk of becoming confused. This is a description of a coal gas flame:—"Its luminosity is due to superheated, separated carbon set free from acetylene, an easily decomposed gas, which is formed from other hydrocarbons composing the gas used as fuel by the heat of combustion in the outer envelope." One is accustomed to the American spelling of "luster," "vapor," &c., but the omission of the final e in "oxid," "sulfid," "chlorid," &c., if intentional (*oxide* also occurs), is un-English.

J. B. C.

Elementary Experimental Science. Physics. By W. T. Clough. *Chemistry.* By A. E. Dunstan, B.Sc. Pp. vi+239. (London: Methuen and Co., 1904.) Price 2*s.* 6*d.*

THE course of work provided in this little book is intended for young beginners who propose to present themselves for examinations of the standard of the University Junior Locals. The book aims at supplying the necessary general information, and also sufficiently explicit instructions for laboratory work. In the physics section 157 experiments are provided, and in chemistry there are 110, but a number of them are more suitable for lecture demonstrations than for laboratory exercises. A pupil who works through the book, performing the more important of the experiments given, cannot fail to obtain a fair knowledge of the fundamental principles of physical and chemical science.

Notes from a Lincolnshire Garden. By A. L. H. A. Pp. 93. (London: Elkin Mathews, 1903.) Price 2*s.* 6*d.* net.

THESE notes are chatty, interesting, and intelligent. The writer loves the garden and everything that happens in or near it. The book is an instance of the humanising effect of nature-study undertaken for the love of the subject. The little book may be recommended to all lovers of country gardens.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Heating Effect of the Radium Emanation.

IN a letter to NATURE of November 5, Prof. Schuster has made some remarks on a letter published by us the week previously, containing a brief account of some experiments to show that the heating effect of radium is temporarily reduced by the removal of the emanation, and that the tube containing the emanation separated from the radium shows a considerable heating effect.

The difficulty felt by Prof. Schuster apparently arose from the fact that we included in the heating effect of the emanation not only that due to the emanation itself, but also that due to the secondary products to which the emanation gives rise. It was an oversight on our part to have omitted in the sentence "more than two-thirds of the heating effect is not due to the radium at all, but to the radio-active emanation which it produces from itself," the words "together with the secondary products to which the emanation gives rise." We were fully aware that the heating effect was in part due to the "excited activity" produced by the emanation. We specially mentioned the gradual decay of the heating effect of radium to a minimum in the course of a few hours, and the increase of the heating effect of the emanation tube during the same period. These effects are connected with the gradual decay and rise, respectively, of the excited activity produced by the radium emanation. The results would have little meaning if we believed the heating effect was due to the emanation alone, for, as Prof. Schuster quite correctly points out, the heating effect in such a case should at once drop to a minimum after removal of the emanation, and the heating effect of the tube containing the emanation should not at first increase.

On account of the rapid rise of the excited activity in a tube containing the radium emanation, the separation of the heating effect of the emanation from the complicated secondary changes which result from it is a difficult experimental problem.

Our letter was merely a preliminary announcement of the results of our experiments. It is not possible to discuss the consequences to be deduced from the experiments without entering into a detailed description of the measurements. We hope to publish shortly a full account of our work on the various heating effects.

McGill University, November 20.

E. RUTHERFORD.
H. T. BARNES.

The Pearl-Oyster Parasite in Ceylon.

MR. JAMES HORNELL, who is still in Ceylon carrying on the investigation of the pearl-oyster fisheries which I started in 1902, tells me in a letter just received that he has now succeeded in finding the final stage of the cestode larva which we found to be the nucleus of the best Ceylon pearls. We found this larva (a Tetrarhynchus), in the spring of 1902, in the pearl-oyster, and, later on, what we took to be its later stages in the file-fishes (Balistes) which feed upon the pearl-oysters, and we felt pretty certain (as I stated in the first part of my report, now published) that the adult would be found in Trygon or some other large Elasmobranch. Mr. Hornell writes from Trincomalie, November 16, as follows:—"Just a line to tell you that I have found the final host of *Tetrarhynchus unionifactor*.[1]

"It occurs, as surmised, in one of the large rays—a Trygon, I believe, but I have no work on fishes, and cannot identify at present.

"There is, I believe, practically no doubt as to species, in the stomach of the ray being two Balistes entire, and apparently just devoured, and plenty of bones. In the folds

[1] The name we gave to this Tetrarhynchus larva in our notes and letters until it was ascertained whether the species was known or new.—W. A. H.

of the spiral valve various Tetrarhynchids, *mature*, of two sizes—I fancy of [two] species—which bears out Shipley's belief of 2 species being in Balistes. In the stomach a larval Tetrarhynchid just where a larva should be—the adults being further along the canal."

The rest of the letter, hurriedly written to catch the mail, refers to other matters.

Mr. Arthur Shipley, who is writing a joint paper with Mr. Hornell on the parasites of the pearl-oyster for my report, will no doubt discuss the matter fully later on, when he has examined the specimens, but it is, I think, only due to Mr. Hornell, who is working most energetically in the wilds far from books of reference or any other scientific help, that his interesting announcement should be made public as soon as possible. W. A. HERDMAN.

University, Liverpool, December 9.

The Late Leonid Meteor Shower.

SUSPECTING that the tail or following segment of this swarm, owing to its enormous length, might be outside the sphere of influence of Saturn in 1870, and Jupiter in 1898, the writer kept watch as follows to see how far this suspicion might prove to be correct:—

Friday morning, November	13,	... ...	Overcast
Saturday	,,	,,	14, 3 to 4	No Leonids
Sunday	,,	,,	15, 12 to 2.30 ...	2 Leonids
			5 to 5.30 ...	No Leonids
Monday	,,	,,	16, 12 to 4.15 ...	Intense shower
Tuesday	,,	,,	17, ...	Overcast
Wednesday	,,	,,	18, 5 to 5.30 ...	3 Leonids

One of the two Leonids observed at about 12.30 on November 15 diverged with a long, slow motion from Zeta Leonis to below the stars Nu and Zeta, Ursa, giving one the impression of its being an almost "end on" one from near the radiant, while the other, at about 2 a.m., passed high up on the right with a bright flash or streak. A further short watch was kept from 5 to 5.30 with no results; hence the conclusion that the shower would be of no very imposing character. This, however, proved to be incorrect, as on the following morning, November 16, at 12.30, a bright flash overhead, and shortly afterwards two fine meteors diverging right and left from a point near Zeta inside the Sickle, indicated increased activity.

The display rapidly increased, the meteors coming apparently in little flocks or shoals, the majority from an area of, say, 6 degrees by 3 degrees along Leo, with an hourly rate which he estimated as high as from 80 to 100, but this would seem to be below the mark. Between 3 and 4 a.m. several bright meteors diverged upwards and downwards from the Sickle, thus enabling him to fix the radiant as close by its old position at 149°+22°. The following morning, November 17, was overcast, but the radiant was still active on November 18, one of the three Leonids observed radiating upwards over Eta from within the Sickle as usual. A remarkable feature was that many of the meteors diverged upwards towards the S.W., whilst others diverged downwards N.E., as if conforming to the ecliptic, an appearance which may have been due to the rotation of the earth, and had been noticed before in connection with other well-known showers. Many of the larger meteors lit up the atmosphere with fine, bright, steel-like flashes.

At 4.15 the sky became overcast, but as he turned in he could still see meteors falling in the west and north-west, and it would appear, from observations made elsewhere, that the maximum occurred during the next two hours, *i.e.* from 4 to 6. It may here be remarked that this shower seemed in previous years to be at its best about an hour or so before daylight, owing, no doubt, to its then high altitude.

Altogether, the display was much above the average, and would appear to have justified the anticipation that the tail end held on its course. At any rate, we get another glimpse into the mechanics of a meteor stream, and more particularly into that of the Leonid, and the distribution around the orbit of the latter, should it still intersect the path of the earth, is a question for the future.

W. H. MILLIGAN.

2 Barronville, Holywood, Co. Down, November 30.

MR. HENRY'S letter in your issue of November 26 contains several notable points which confirm my own observations. Being engaged on other work (which entailed long spells within the observatory and the dark room) throughout the night of November 14 and early morning of November 15, I noticed only a few meteors, and, as the sky became overcast here at 4.45 a.m., it is evident that, according to Mr. Denning's account, observations of the maximum display were impossible at South Kensington.

However, on the early morning of November 16, 2.15–3.50 a.m., my watch was rewarded by the appearance of more than fifty Leonids, some of which were exceedingly bright and lasting. Facing the south-east, I had familiar constellations (Orion, &c.) in the field of view, and was consequently able to record the trails among the stars with a fair amount of certainty.

The most striking point on which Mr. Henry's observations are confirmed by mine is that there were decidedly *two* apparent separate radiants, the one very near to, or coincident with, that given by Mr. Denning in NATURE for November 12, and another, from which quite half of the observed meteors seemed to emanate, at about R.A. = 145°, Dec. = +17°. Several Leonids with short trails were seen quite near to "the Sickle," and indicated by their direction the existence of this second radiant point. One long-trail Leonid occulted ξ Geminorum, and if the trail had been prolonged (it stopped short about two or three degrees from Betelgeuse) it would have passed between α, γ, and $\lambda\phi$ Orionis. The majority of the meteors observed by me passed from the direction of Leo towards Gemini, Orion, or Canis Minor. WILLIAM E. ROLSTON.

Solar Physics Observatory, South Kensington, S.W., December 5.

Weather Changes and the Appearance of Scum on Ponds.

SOME years ago I also observed the phenomenon of a sudden appearance of scum on the surface of a pond similar to that mentioned by "Platanus orientalis" in NATURE, November 5.

The explanation, however, given by Dr. Mill in the same number of NATURE, namely, that the appearance of scum is occasioned by an accelerated flow of springs rising through the chalk of the floor of the pond, does not apply to the case which I have observed. That pond had no springs of the kind, but was fed by a very small and slow creek emptying into the pond at its upper extremity. Although the pond was pretty large, the scum did not appear near the inlet only, but all over the pond at the same time.

I wish to offer the following explanation of the phenomenon so far as it came under my observation, and I am inclined to believe that it applies to the case of "Platanus" just as well.

Our pond was very rich in marsh gas, a fact which could be easily ascertained by thrusting an oar into the soft bottom, when large bubbles of this gas would come to the surface. Now it is quite natural that this gas, slowly generated as it is, within the layer of decaying vegetable matter at the bottom of the pond, will gather in little bubbles, and these in turn will rise, provided they have acquired a sufficient buoyancy to break through their mouldy matrix, tearing off and carrying some of the solid matter up to the surface.

Ordinarily, this will take place all the time at regular intervals, but at a very slow rate, and would, therefore, escape observation. In time of a sudden fall of atmospheric pressure, however, the case is different. Then all the gas bubbles which are more or less ready to rise under normal conditions will suddenly expand and rise simultaneously, carrying upward not only a few isolated particles, but entire layers of soft material. I have often observed this very phenomenon, although I failed to notice the atmospheric condition at the time.

The material itself which was thus thrown to the surface consisted, so far as I can recollect, of black-brown vegetable matter, derived chiefly from leaves that had fallen into the pond, and of a green slime, consisting of numerous algæ.

FRED. J. HILLIG.

St. John's College, Toledo, Ohio, U.S.A.